nect together by a regular gradation (as is well known) any such arithmetical series with a geometric series, whose common ratio is the 2nd term of both series. The theorem may be stated without the series thus :—

If any geometric series (having 1 for its first term) and $(1+n)$ for its common ratio, be stayed at the $(p+1)$th term and discontinued as a *geometric* series, but be continued from that term as an *arithmetic* series of the *pth* order, by forming it with the *pth* difference as the constant difference, and the other differences (which will be x, x^2, x^3, &c. . . . . x^p). The resulting series will be the series stated in the theorem above, and any number may be formed by not exceeding $(pn+1)$ terms, that is $(pn+1)$ will be the notation-limit of the series; if p becomes indefinitely great, the limit of the series is a geometrical series, and it would become capable of expressing any number according to a system of notation whose base or local value would be $(1+n)$.

The proof of the theorem seems to depend upon this, that the notation-limit assigned by the theorem is actually the notation-limit of all the geometric terms and one more, at least, while the geometric terms alone fix the law of the series and ascertain its *elements* (that is, the first term and the successive differences); and as the combinations necessary to enable the series to fulfill its law, and carry on the notation that belongs to it, are regulated by the series next below it, viz. by the first rank of differences, while the supply of new combinations (as the series advances and the number of terms that may be used increases) is indicated by even a higher series than itself, the new combinations are always greater, and at length indefinitely greater, than the number required. If therefore within the range of those terms that ascertain and fix the law of the series the law of its notation-limit can be obeyed, it must always (*à fortiori*) be obeyed as the series proceeds to a greater number of terms and to a variety of combinations increasing in a higher ratio; and the series will furnish the numbers requisite to carry on the notation by the new and more numerous combinations which must of necessity be of the same numerical kind with those which have preceded them. It is shown at length, that the new combinations, as the series advances, do actually increase in an increasing proportion compared with the numbers required.

2. "Experiments on the section of the Glossopharyngeal and Hypoglossal Nerves of the Frog, and Observations of the alterations produced thereby in the Structure of their primitive fibres." By Augustus Waller, M.D. Communicated by Professor Owen, F.R.S. &c.

After describing the natural structure of the tubular fibres of the nerves, the author states the results which he observed to follow the section of the nerves of the frog's tongue. To this organ two principal pairs of nerves are distributed; one of these, issuing from the cranium along with the pneumogastric and distributed to the fungiform papillæ, is regarded as the glossopharyngeal; the other,

arising from the anterior part of the spinal cord, and passing through the first intervertebral foramen, the author (following Burdach) names the hypoglossal. Section of the glossopharyngeal nerves does not cause any perceptible loss of motion or of common sensation, and this fact, together with its distribution to the fungiform papillæ, leads the author to consider this nerve as the nerve of tasting. On the other hand, when the hypoglossal nerves are divided, the tongue is no longer sensible to mechanical irritation, and its motions are entirely abolished. Simultaneous division of the right and left glossopharyngeal nerves is followed by the death of the animal in a few days, and the same effect ensues after division of both hypoglossals. This result, which takes place more speedily in summer than in winter, the author is disposed to ascribe to a disturbance of the mechanical process of respiration, in which, as is well known, the muscles of the frog's mouth and tongue take a large share.

To ascertain the changes which take place in the nerve-fibres after division of the trunks to which they belong, the operation was confined to the nerve of one side only, and the fibres of the uninjured nerve of the other side served for comparison. These changes ensue more speedily, and go on more rapidly in summer than in winter, commencing usually in about five days. The pulp contained in the tubular nerve-fibres, originally transparent, becomes turbid, as if it underwent a sort of coagulation, and is soon converted into very fine granules, partly aggregated into small clumps, and partly scattered within the tubular membrane. These granules are at first abundant, and render the nerve-fibre remarkably opaque; but in process of time they diminish in number, and, together with the inclosing membrane, at length disappear, so that at last the finest ramifications of the nerves which go to the papillæ, or those going to the muscular fibres of the tongue (according to the nerve operated on), are altogether lost to view, in consequence of the destruction and evanescence of their elementary fibres. The disorganization begins at the extremities of the fibres, and gradually extends upwards in the branches and trunk of the nerve. The other tissues of the tongue remain unaltered. When the cut ends of the nerve are allowed to reunite, the process of disorganization is arrested, and the nervous fibres are restored to their natural condition. The author ascribes the disorganization and final absorption of the nerve-fibres to an arrestment of their nutrition caused by interruption of the nervous current, and considers his experiments as affording most unequivocal evidence of the dependence of the nutrition on the nervous power.

February 28, 1850.

PETER MARK ROGET, M.D., Vice-President, in the Chair.

The following papers were read:—

1. "Sequel to a Paper on the reduction of the Thermometrical